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Workshop 14

Use of Fellowships

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## Use of Fellowships

### Abstract

The effective use of Space Grant Program fellowships are critical in meeting program objectives. In the first year of operation the 21 Colleges/Consortia will expend from 30-40 percent of their grants for fellowships; program policy will allow up to 50 percent to be spent for fellowships. Thus, fellowship policy must be carefully implemented and monitored.

### Fellowship Objectives

In aerospace and space science fields the United States has historically been the world's leader. Even in recent years when launching difficulties brought our technical and management strengths into question, it still remained true that the pool of skilled scientific and engineering talent in the United States was unrivaled.

Recent trends raise fears that we might lose our leadership position in human resources. The Association of Aerospace Industries reports increasing difficulty in hiring new technical and engineering workers (Aerospace Education 2000, 1989). University representatives say that the quality of graduate student applications in space science has declined. A probable cause of declining interest is the publicity surrounding the Challenger disaster and its effect in retarding the nation's space program.

Another trend with alarming implications is the avoidance of space science and engineering fields by racial or cultural minorities and by women. These groups make up an increasing share of the American work force, and their absence from space-related fields in the future would mean a serious loss of important talent.

The objectives of a fellowship program should be to:

1. Attract talented students into space and aerospace fields.
2. Increase representation of minorities and women in these fields.
3. Promote effective and high quality training in these fields.

The first two follow directly from obvious needs. The third reflects the effect that declining student interest can have on educational programs. It is a legitimate objective of Space Grant Fellowships to contribute to strengthening educational programs which are fundamentally healthy and important, but which are endangered by recent lack of strong student participation, by funding additional students for these programs.

### Types of Fellowships and Institutional Strategies

Institutional strategies can be expected to vary widely among the Space Grant Consortia, depending on the particular strengths of the institutions, on tuition costs, and on the ability of the institution to recruit from under-represented groups. Here we offer brief comment on a few of these issues, but in practice each institution will best know its own strengths and can best devise its own strategy.

Different types of fellowships can be offered. For example,

- \* Conventional graduate student academic-year fellowship
- \* Graduate student full-year fellowship
- \* Graduate student partial support
- \* Full support undergraduate fellowship
- \* Undergraduate partial support

Balances must be struck between several conflicting benefits of different types of fellowships.

1. On the one hand it is desirable to award as many fellowships as possible, but on the other hand it is important to make the fellowships as large as possible, so that their attractiveness is maximized. How large should fellowships be?
2. It is desirable to open opportunities for students at the undergraduate level, but the typical effectiveness of an undergraduate fellowship is probably smaller than that of a graduate one because student ability, interest and commitment is not as easy to evaluate. What is the best balance between undergraduate and graduate fellowships?
3. It is extremely important to attract under-represented groups into space-related fields, yet it is often particularly difficult to predict success or retention rates for these students because their records are unconventional. How much risk should be accepted in offering fellowships to students who may be very promising, yet come from backgrounds that are difficult to evaluate.

Different Space Grant institutions can be expected to find different ways of meshing their strengths with the fellowship objectives. For example, private institutions with (a) high tuition charges, and (b) strong graduate programs, might choose to focus on graduate student fellowships, because their relatively small number of fellowships would have very limited impact at the undergraduate level. On the other hand, public institutions with lower tuition charges might effectively utilize fellowship funds at the undergraduate level, and might choose to make this their focus.

Summary of fellowship strategy questions which each Space Grant Consortium and College must answer:

- \* What is the best balance between undergraduate and graduate fellowships?
- \* What should be the size of awards?
- \* What pool of students should be the focus?
- \* How should fellowships be advertised?

#### Program Evaluation

Among the points that will enter an evaluation are:

1. Institutional strategy for Space Grant fellowships
2. Recruitment effort
3. Quality and diversity of awardees
4. Success of awardees
5. Impact on educational programs

It is extremely important that evaluation procedures not become rigid or intimidating. In general, it is difficult to evaluate the success of educational ventures because it takes a long time to determine the influence of an experience on a student. The consequences are often indirect. Evaluation procedures can easily become destructive. For example, a fellowship award committee might begin to operate under a quota system, or might confine awards to safe cases of assuredly successful students, if the committee felt that it might lose its fellowships with any other course of action.

Thus for program evaluation, institutions should be encouraged to describe their own unique circumstances, their strategy for meeting the Space Grant objectives, and their frustrations as well as their successes. A set of guidelines, such as the headings at the beginning of this section, might be provided, but the diversity of Space Grant institutions should be acknowledged in the NASA requests for reports.

Also, to benefit all concerned, reports should be kept brief, so that they will be read and so that their preparation is not so time-consuming that it interferes with the programs themselves.

Several additional points were raised during the Fellowship Workshop at the January 1990 Space Grant Conference.

1. It is clearly beneficial to use matching funds to stretch the number of fellowships as far as possible.
2. It will not be possible to name the fellowships identically across all colleges, even though there might be prestige benefits in doing so. Unfortunately, the use of matching funds, which is essential, will often require acknowledgment of other sources, as well as the Space Grant, in the name. In any case, a nice name which indicates the honor to the awardee would always be a good idea.
3. No matter at what academic level the fellowships are awarded, a strong effort should be made to encourage the awardee to make a lasting commitment to a space related field. Regular meetings with an advisor or mentor, for example, would be a good idea.
4. Another idea to encourage students to make a lasting commitment is to offer continuation of fellowships for more than one year if academic progress is satisfactory. One way to do this without costing the Space Grant program any money would be an arrangement with the University or the State for a matching year's support.
5. Different Space Grant institutions might cooperate to assist students. For example, an undergraduate Space Grant Fellowship awardee might be given preference for a graduate fellowship at another institution.